(ii) a comparison between the stored intensity of each of the white and black lines and a detected intensity of each of the white and black lines;

(iii) a comparison between the stored size of each of the white and black lines and a detected size of each of the white and black lines;

(iv) a comparison between a sum of the stored size of each of the white and black lines and a sum of the detected size of each of the white and black lines;

aligning in a first alignment position the cutter with the boundary mark recognized in accordance with the recognizing step;

cutting for a first time the substrate with the cutter in the first alignment position;

feeding the substrate further into the automatic device;

detecting another of the boundary marks with the first optical sensor and with the second optical sensor;

repeating the recognizing step for the another boundary mark;

aligning in a second alignment position the cutter position with the another boundary mark recognized in accordance with the recognizing step;

determining an angular correction for the second alignment position with respect to the first alignment position; and

cutting for a second time the substrate with the cutter in the second alignment position if the angular correction is less than the greatest drift of the substrate. --

REMARKS

Claims 1, 2 and 8-12 are currently pending in the application, as amended. Claim 1 has been amended to recite as an additional limitation that the microprocessor has stored therein "a stored intensity and a stored size respectively corresponding to the size and intensity of each of the white and black lines" and that the microprocessor (12) is configured "(i) to recognize the boundary marks (M) based on a detection of the boundary mark by both the first and second optical sensors and a comparison between the stored intensity and a detected intensity of each of the white and black lines, and (ii) to control the second and third motors (9, 5) based on recognition of the boundary marks (M)." These limitations are disclosed in the specification, see page 5, lines 9-25. Additionally, new claims 9-11, depending from claim 1, have been added and recite additional limitations for controlling alignment and cutting also

disclosed in the specification. New claim 12 has been added to claim a method of operation and recite steps corresponding to the limitations recited in claims 1 and 9-11. Amended claim 1 and new claims 9-12 are the same as the claims proposed and discussed during the telephonic interview held on February 13, 2003.

Interview

The undersigned would like to thank the Examiner for the courtesies extended during the telephonic interview held on February 13, 2003. During the interview, Applicant's proposed amendment to claim1 and the addition of new claims 9-12 were discussed. In support of the patentability of the proposed claims, Applicant argued that the invention as claimed is distinguishable over the prior art of record and more particularly, over U.S. Patent No. 5, 586,479 (Roy *et al.*), as the prior art does not disclose for trimming and cutting photographic substrates an automatic device having a microprocessor that stores the intensity and size of white and black lines comprising a boundary mark and that recognizes the boundary mark based on a detection of the boundary mark by both a first and second optical sensors and a comparison between the stored intensity and a detected intensity of each of the white and black lines. The Examiner stated that the proposed limitation appears to traverse the prior art rejection but would require further consideration and/or search. The Examiner additionally stated that proposed method claim 12 may or may not be examined based on whether a restriction was warranted.

Claim Rejections – 35 U.S.C. §103

The Examiner has rejected claims 1, 2 and 8 under 35 U.S.C. §103(a) as obvious over Roy *et al.* The Examiner contends that Roy *et al.* discloses a cutting device with almost every structural limitation of the claimed invention including a first pair of rollers (e.g., 56, 62) which are coupled and thus driven together by a first motor; a cutting assembly (e.g., 60) which is driven by a second motor; a third motor (e.g., 84) pivoting one of the cutting assembly and the pair of rollers; a reading system having first (e.g., 58A) and second (e.g., 58B) spaced apart optical sensors; and a micro-processor (e.g., 30) which recognizes marks on the workpiece. The Examiner admits that Roy *et al.* does not disclose a microprocessor having stored therein a preset sequence of marks corresponding to the feature of the boundary marks, specifically the preset sequence of white and black lines oriented at right angles to the workpiece feed direction. The

Examiner takes official notice that such marking is old and well known in the art for various known benefits including providing automatic triggering of various different operations during a processing of a work piece. Applicant respectfully traverses this rejection in view of the foregoing amendment.

Claim 1 as amended is directed to an automatic device for trimming and cutting at right angles paper and other graphic and photographic substrates (1) with a series of images (10) printed thereon and marked by boundary marks (M) comprising a preset sequence of white and black lines extending along an edge of each of said images (10) oriented at right angles to a feed direction of the substrate, each of the white and black lines having a size and an intensity, and recites, *inter alia*,

> a microprocessor (12) . . . having stored therein a stored intensity and a stored size respectively corresponding to the size and intensity of each of the white and black lines, the microprocessor (12) configured (i) to recognize the boundary marks (M) based on a detection of the boundary mark by both the first and second optical sensors and a comparison between the stored intensity and a detected intensity of each of the white and black lines, and (ii) to control the second and third motors (9, 5) based on recognition of the boundary marks (M).

Applicant has amended claim 1 to more particularly point out and claim that the microprocessor compares the intensity of each of the white and black lines comprising the boundary mark as detected by both the first and second optical sensors with the intensity of each of the corresponding white and black lines stored in the microprocessor and controls the second and third motors based on recognizing the boundary mark. Those skilled in the art will understand that in the context of claim 1, "recognition" occurs when the detected intensity is within a predetermined threshold based on the stored intensity.

Support in the specification for the amendment to claim 1 can be found on page 5, lines 9-16, which discloses,

> . . . the recognition of the mark and the consent to the cutting are linked to as much as six different security levels, namely:
> - the cutting mark consists of a precise white/black sequence stored in the microprocessor, which can recognize through scanning any type of mark with said features without any

limit in size;

- during the scan, the device microprocessor stores the level of intensity of the white and black lines in order to create thresholds of acceptance and recognition. . .

Roy *et al.* does not disclose each and every element of the present invention and is an entirely different device from the present invention. Roy *et al.* discloses a cutting apparatus 26 that determines the amount of skew of images on an edge registered receiving sheet by detecting with a sensor device the lead edge of the images. The disclosed sensor device indicates to a logic/control 30 that the leading edge of the image has been detected when a pair of photodiodes senses a discontinuity in the reflectance of the receiving sheet. Col. 4, ln 62-67. Roy *et al.* teaches that the discontinuity in reflectance arises due to a change from the absence to the presence of pigmented toner at the lead edge of the image. Col. 4, ln 63-64. Roy *et al.* also teaches that the discontinuity in reflectance could be achieved by placing a small dark mark just ahead of the leading edge of an image, Col. 5, ln 4-5, or by depositing clear toner at the leading edge of an image if pigmented toner is absent. Col. 5, ln 12-13.

Roy *et al.* does not disclose "a microprocessor (12) . . . having stored therein a stored intensity and a stored size respectively corresponding to the size and intensity of each of the white and black lines" comprising a boundary mark. Additionally, Roy *et al.* does not disclose a "microprocessor (12) configured (i) to recognize the boundary marks (M) based on . . . a comparison between the stored intensity and a detected intensity of each of the white and black lines, and (ii) to control the second and third motors (9, 5) based on recognition of the boundary marks (M)." Furthermore, there is no objective teaching in Roy *et al.* that would enable one of ordinary skill in the art to modify the Roy *et al.* device in a manner that would render the present invention obvious under 35 U.S.C. § 103(a).

Accordingly, Applicant respectfully requests that the rejection of claim 1, and claims 2 and 8 depending therefrom, be withdrawn.

New Claims

Applicant has added new claims 9-11. Claim 9 depends directly from claim 1 and recites, in pertinent part, that the microprocessor (12) is further configured "to recognize the boundary marks (M) based on a comparison between the stored size of each of the white and

black lines and a detected size of each of the white and black lines." Claim 10 depends directly from claim 9 and recites, in pertinent part, that the microprocessor (12) is further configured "to recognize the boundary marks (M) based on a comparison of a sum of the stored size of each of the white and black lines and a sum of the detected size of each of the white and black lines." Claim 11 depends directly from claim 10 and recites, in pertinent part, that the microprocessor (12) is further configured "to recognize the boundary marks (M) based on a determination that an angular correction for a second alignment and cutting with respect to a first alignment and cutting is less than a greatest drift which can be caused by the at least a pair of rollers (2) during a feed of the substrate."

Support in the specification for the limitations recited in claims 9-11 can be found on page 5, lines 17-25, which discloses,

> - each line is also measured in thickness with a precision of 0.05 mm and is then compared with the corresponding stored size;
> - the sum of the lines must correspond to the stored sum so as to prevent the tolerances, by adding up together, from causing errors;
> - the mark M must be detected by both sensors in order to give the consent to the cutting;
> - after the first alignment and cutting, the angular correction must be within an angle equivalent to the greatest drift which can be caused by the rollers 2 during the paper feed.

Accordingly, no new matter has been added.

New claim 12 is a method claim directed to a method for the operation of the automatic device for trimming and cutting photographic substrates as claimed in claim 1 and additionally includes steps directed to the devices claimed in dependent claims 9-11. Applicant respectfully submits that the method as claimed can not be practiced by another materially different apparatus or by hand and that the apparatus as claimed can not be used to practice another and materially different method. Accordingly, a restriction requirement is in appropriate.

CONCLUSION

In view of the foregoing amendment and remarks, Applicant respectfully submits that the present application, including claims 1, 2 and 8-12, is in condition for allowance, and such action is respectfully requested.

Respectfully submitted,

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(Date)

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MARKED-UP VERSION OF AMENDED CLAIM

1. (Five Times Amended) An automatic device for trimming and cutting at right angles paper and other graphic and photographic substrates (1) with a series of images (10) printed thereon and marked by boundary marks (M) [having a feature] comprising a preset sequence of white and black lines extending [at least along a whole edge] along an edge of each of said images (10) oriented at right angles to a feed direction of the substrate, each of the white and black lines having a size and an intensity, the automatic device comprising:

at least a pair of rollers (2) for feeding the substrate;

a first motor (3) driving the pair of rollers;

a cutting assembly (7) spaced apart from the pair of rollers, the cutting assembly having a cutting width;

a second motor (9) driving the cutting assembly to cut;

a third motor (5) pivoting one of the cutting assembly and the pair of rollers from time to time to align said cutting assembly (7) and one of said boundary marks (M);

a reading system having first and second spaced apart optical sensors (4, 4') that detect one of the boundary marks (M) between the images, the second optical sensor spaced from the first optical sensor a distance equal to a fraction of the cutting width; and

a microprocessor (12) in communication with said reading system and the second motor (9) and the third motor (5), the microprocessor having stored therein [a preset sequence of marks corresponding to the feature of the boundary marks (M)] a stored intensity and a stored size respectively corresponding to the size and intensity of each of the white and black lines, the microprocessor (12) [processing a signal from the reading system, recognizing the feature of the boundary mark (M), and controlling] configured (i) to recognize the boundary marks (M) based on a detection of the boundary mark by both the first and second optical sensors and a comparison between the stored intensity and a detected intensity of each of the white and black lines, and (ii) to control the second and third motors (9, 5) based on recognition of the boundary marks (M) [,

wherein the device is able to perform the cutting in two mutually orthogonal directions upon rotation of the substrate (1) through 90° without guides for edge registration of the substrate].